

**SUMMARY OF THE MEETING OF THE
ADVISORY COMMITTEE ON WATER INFORMATION'S (ACWI)
SUBCOMMITTEE ON HYDROLOGY (SOH)
12:30 p.m. – 3:45 pm, Eastern Standard Time
July 28, 2016**

1. Welcome

Chair Robert Mason introduced the agenda, acknowledged and thanked Sujay Kumar of the National Aeronautics and Space Administration (NASA) for hosting the meeting and arranging for the very interesting and informative tour of the NASA facility.

2. Roll-Call

A roll call was performed for in-person attendees and those on the phone. The list of attendees is included as Attachment 1.

3. Words from our Host

Robert introduced Christa Peters-Lidard, who welcomed everyone to Goddard. She provided a brief overview of NASA Goddard, the Earth Sciences Division, and the Hydrological Sciences Lab, as well as an orientation to the meeting facility.

4. Background on SOH

Robert provided an introduction to the SOH. The SOH is part of the ACWI, which provides information and advice to the federal government. The SOH focuses on surface water quantity. There are numerous member organizations and workgroups.

5. Feature Presentation

Robert introduced Sujay who outlined the NASA presentation and introduced personnel from the Hydrological Sciences Lab. Sujay mentioned that NASA wanted to prepare a proposed white paper about hydrologic observations and remote sensing. A number of NASA personnel then presented short talks highlighting various NASA missions and satellite based instruments.

The Global Precipitation Measurement (GPM) program was presented by Dalia Kirschbaum, associate deputy project scientist. The GPM mission follows and continues the work of the Tropical Rainfall Measuring Mission (TRMM). The GPM core observatory was built and assembled at Goddard and utilizes dual frequency radar. The GPM mission extends coverage north and south of TRMM. The network of satellites produce a global picture every three hours. There are many areas of societal benefit; example applications include landslides and flooding; and agriculture and drought. Related projects include the Famine Early Warning System, (FEWS) which can detect drought.

The Snow Mission was presented by Ed Kim. Snow is important as a water resource and as a control on the surface energy balance. One-sixth of the people on the planet depend on snow for water. Ninety percent of the renewable water in the western U.S. comes from snow. Nine out of the 20 top floods in the U.S. are related to snowmelt. However, measuring the amount of snow is not an easy question. Snow missions must address global snow; must include multiple sensors, and need mature sensor technology and algorithms. Satellites are expensive and multi-sensor missions are more expensive.

International partnering is key. The societal benefits and the contributions to science from this technology are already strong. For snow measurement, no single sensing technique works well across a wide variety of snow types and conditions. To determine the optimum combination of techniques, a multi-sensor field campaign is needed. This first year of the mission, NASA Goddard is leading the effort with a focus on forests. Please visit Snow.nasa.gov >snow-ex for details.

The Soil Moisture Active Passive (SMAP) Mission was presented by John Bolten, the associate program manager of water resources at the hydrological sciences lab. The SMAP mission goal was to measure the sensitivity of soil moisture passive combined with radar. The radar died a few months after launch in January 2015, and the mission is now a passive-only product. Soil moisture is useful for initializing climate forecasts and also for analyzing drought. The research is currently pairing precipitation and soil moisture to illustrate “precipitation memory”.

Gravity Recovery and Climate Experiment (GRACE) was presented by Matt Rodell, chief of the hydrological sciences lab. Currently, surface observations are inadequate on a global scale, especially for groundwater. In this experiment, two satellites monitor each other for the changing gravity field; as water moves around the earth, the gravitational potential changes and perturbs the satellites’ orbits. The experiment produces terrestrial water storage variations on a monthly basis. The study seeks to explain any emerging trends. GRACE observes changes in water storage caused by natural variability, climate change, and human activities such as groundwater pumping. Launched in 2002, this was planned as a five year mission, and it will not last any longer than 2017. The follow up mission will launch in February 2018, so there will be a minimal data gap.

Sujay presented two missions on behalf of Mike Jasinski, who could not attend the meeting. The Ice, Clouds and Land Elevation Satellite (ICESat-2) mission is for inland water height data products. ICESat-2/ATLAS (Advanced Topographic Laser Altimeter System) is designed for ice cap and sea ice monitoring. It also produces inland water data products such as water surface height, slope and water body maximum slope and aspect. The MABEL field campaign was a flight over Lake Mead, and the results indicate a good match with the satellite data. An article is in press.

The Surface Water Ocean Topography (SWOT) mission was also presented. The SWOT mission combines surface water hydrology with physical oceanography and is focused on a better understanding of the world's oceans and its terrestrial surface waters and measuring how water bodies change over time. SWOT was one of 15 missions listed in the 2007 National Research Council Decadal Survey of Earth science as missions that NASA should implement in the coming decade. By measuring water storage changes in all wetlands, lakes, and reservoirs and making it possible to estimate discharge in rivers, SWOT will contribute to a fundamental understanding of the terrestrial branch of the global water cycle. SWOT will also map wetlands and non-channelized flow.

The Evapotranspiration (ET) missions were presented by Thomas Holmes of the hydrological sciences lab. ET is important as it is the link between the energy, water and carbon cycles. The Atmosphere Land Exchange Inverse (ALEXI) mission included applications with thermal infrared. The new MW-ALEXI (microwave infrared) may improve data quality. Other projects in development are a proposal to fly a new thermal instrument for ET measurements and a white paper in response to the NRC Decadal Survey.

Flood mapping was presented by Fritz Policelli. This project is observation-based flood mapping. Real time observations have a surface water mask applied; subtracting the surface water mask yields the flood water extents. This product is under the MODIS product distribution systems. The project produces 1-, 2-, 3-, and 14-day composites. These composites are produced to eliminate clouds and cloud shadows. In a different interface, a LandSat product is being added. LandSat does not have the water mask and just maps the real time water. One example project is a flood extent and assessment project in Southeast Asia, which was tied to socioeconomic data.

Modeling work was presented by Sujay. The focus of the lab is assimilating all the available data into modeling, using the remote sensing data for land data assimilation. Satellite measurements are available that can be used to constrain the water budget from the land surface models. One example is multivariate assimilation of satellite-derived remote sensing datasets in the National Climate Assessment LDAS. This project looks back 30 years and assesses the remote sensing data and compares to U.S. Geological Survey (USGS) gages. The remote sensing appears to offer some improvements and some degradations to the model results, and in general better in the eastern U.S. than the western U.S. There is a plan to fuse these datasets and provide continuous datasets through modeling.

The applications program was presented by Dalia, who is also the acting associate applied sciences director at Goddard. The NASA GSFC applied sciences program includes mission applications, applied sciences and R&A programs, reimbursable projects (such as agreements with other agencies or academia), and technology. One example is disaster response, such as providing observations of the historic rainfall amounts from Joaquin/the nor'easter. One of the focus areas is water resources, including drought and streamflow/flood forecasting. There are training programs such as ARSET (Applied Remote Sensing Training). The technology focus looks at ways that data is archived or accessed. The goals for applied science activities are to identify core capabilities and make data more useful for the public.

There were several questions following the presentations.

Tom Nicholson asked that the presentations be distributed and put on the web. Robert said yes, the presentations can be put on the web. *(Note: Sujay provided the slides to Tom and Robert after the meeting via an ftp site; they can be downloaded until Aug 30 at the following link: <https://opendrive.gsfc.nasa.gov/longauth/d/REQw2IC>)*

Victor Hom asked for data sheet with the data accuracy of all these projects. NASA is working on this, it is not ready yet.

Will Thomas asked about the customers/users of the data. NASA said that anyone can access via the web.

Jerry Coffey asked about the early satellite data (TRM) and the extended latitudes with GPM. He had seen flood data from China going back hundreds of years. He saw cyclical behavior in temperate zones, but not in higher latitudes. Would you be able to see something like this? Dalia said TRM data will be reprocessed for a consistent data set.

Peter Evans said that this was a very interesting presentation. He would also appreciate slides. As he is coming from interstate council on water policy, he noted that people are beginning to use this data domestically. To what extent is the data ground-truthed? For planning purposes, how reliable is this

information so it can be used for water supply, operations and planning? NASA replied that these missions have field campaigns to test them.

Tom mentioned that the Extreme Storm Event Work Group (ESEWG) is developing a proposal for extreme rainfall product needs. GPM is not in the proposal. The U.S. Army Corps of Engineers (USACE) is developing a database. Tom would like NASA involved in the ESEWG. NASA collaborates with Japan on this, but a lot of Level 1 products go to the National Oceanic and Atmospheric Administration (NOAA).

Mathini Sreetharan asked about sea surface elevations. NASA replied that the data go back to 1992. Unsure about the datum, NASA will refer her to the right person.

6. Break

A break occurred from 2:25-2:35. Robert recalled the meeting to order at 2:35 pm.

7. Review and approval of agenda

Tom made a motion to accept the agenda. Victor motion to amend misspellings on item 4, which were corrected. Claudia Hoeft motioned to skip the announcements, with written agency reports to be included in the meeting summary. Tom made the motion with the proposed modifications. Will seconded the motion. Hearing no objections, the agenda was adopted. (The agency business reports are presented in this summary as attachments 5-7.)

8. Review of previous meeting summaries

Victor motioned to approve, Claudia seconded the motion. There were no objections. The summaries were approved.

9. Review of action items from prior meetings

Action Item 1: Minutes

Laura Chap and Robert to draft and circulate 4-21-16 meeting summary.
Follow-up: Summary circulated; see email from Robert on May 19.

Action Item 2: Streamflow information workgroup

Robert will distribute a call for volunteers to develop a workgroup for the Streamflow Information workgroup charter.

Follow-up: Workgroup solicitation was distributed by Doug Yeskis (USGS) on May 19 and three meetings have been held.

Action Item 3: Peer review charge

As per Martin's motion, SOH members should review the peer review charge and forward comments to the group. Robert will set up an SOH conference call meeting for a follow-on discussion and a motion to adopt the charge. Persons wishing to suggest additional peer reviewers should speak with Will so that they can be considered during the conference call.

Follow-up: The Hydrologic Frequency Analysis Work Group (HFAWG) chair, Will, prepared an email nominating an expanded list of possible peer review candidates. The list was circulated to the SOH by Robert on May 25 and a "survey monkey" was established for the SOH members to vote on the panel. The panel was approved by a vote of 22 members in the affirmative.

10. Old Business

The status of the public comments on B17C were deferred to the HFAWG report.

11. New Business

There was no new business.

12. News from SOH workgroups

HFAWG - As chair, Will provided the report. (See attachment 2.)

The group continues to move forward on the national flood frequency guidelines (Bulletin 17C) to replace the 1982 Bulletin 17B. The public comment period on the draft ended on April 22. The work group has been reviewing the comments. Fifty comments were received. Most of the comments, which were largely from the Association of State Floodplain Managers (ASFPM), USACE, and the Natural Resources Conservation Service (NRCS), were positive or required minor changes. There were two comments regarding extrapolation of flood frequency curves. A new section will be added to the report on extrapolating flood frequency curves. Approximately eight out of the 50 comments require lengthy responses. Responses to all fifty comments have been prepared, but not all the authors have seen or approved all the comment yet. Some changes will need to be made to the report regarding record extension, such as citing a correlation coefficient for which record extension should be done. The SOH approved five peer reviewers. After revisions, the work group will provide the report to the peer reviewers, to receive their comments within a month. The next step is to move on to the USGS peer review process.

Tom asked if the review was pro bono. Will said yes. Tom said to make sure this is explicitly stated.

Martin Becker wondered if the public is able to use this methodology. He had the understanding that the group would run a test case with four or five people who are competent enough to run the program. We need to make sure that this can be used universally. Robert said this was not in the plan. Martin remembers discussing this four to five years ago. Robert stated that this software has been available for a couple of years and the USGS has trained people. There have been presentations at the American Society of Civil Engineers Environmental and Water Resources Institute (ASCE-EWRI) and ASFPM conferences. Martin suggested we get a few people to test the program.

Don Woodward said he can run it and get answers.

Claudia wondered why the issue with the software is coming up. She noted that Will mentioned that we got comments back on the procedure. Claudia wanted to know if there were comments outside of the agencies.

Mathini commented that Dewberry uses this, and that PeakFQ and HEC-SSP are two of the easiest software packages to use.

Robert stated that Henry Hu and Ben Pope will likely try the software.

Martin is concerned about people who only do flood frequency analysis once or twice a year.

Will responded that program requires more engineering judgement than in the past. It is possible for two people running the program to get slightly different results.

Claudia suggested that we get feedback from people who attended the ASCE and ASFPM short courses.

Martin agreed we could do that, and ask each participant five or six questions.

Robert will take an action item to compile a participant list and put together a survey. He will send to Martin to review.

Martin asked about the length of the classes. Robert answered that EWRI was half a day, ASFPM was shorter.

In response to Claudia's previous question, Will answered that most of the comments were from just a few sources. Will will provide the sources.

Jerry reacted to the extrapolation of flood frequency curves beyond the 100-year. Those comments were from Jerry (and ASFPM). He asked if the extrapolation section could be reviewed by the work group or SOH?

Robert stated that we have written a document, the review of the responses to the comments will be reviewed by the committee. The SOH will have to do the review via email and survey monkey. Jerry says that the SOH cannot make decisions because the expertise is in the workgroup. Robert said that the work group has sent the document to the SOH, and it is now with the SOH. It is for the SOH to decide.

Robert asked that since that the other work groups have nothing controversial, the other reports should be provided in writing. However, there were brief discussions on activities of some of the other work groups.

ESEWG – Tom Nicholson provided the report (See attachment 3.)

Martin commented that he looked at ESEWG report and was concerned that certain sections were not made public. Tom (ESEWG chair) mentioned that some sections of the report, namely cost, can only be sent to federal members, due to possible conflicts of interest with potential bidders and to observe proper procurement processes. He will speak with Robert and Siamak Esfandiary, and they can then decide what do to with the cost section.

Tom needs to talk to USACE (Chandra Pathak) regarding resources for Marian Baker to continue working on the proposal.

Tom would like to include NASA people in the proposal. Dalia suggested staff involved with GPM.

HMWG – Claudia Hoeft provided the report. (See attachment 4.)

Claudia (chair) sent a report to Robert. For the conference, SEDHYD 2019, a request for proposals is going out very soon. An RFP will go out across U.S., but Nevada locations often come back with the best prices. There is a communications problems with the organizing committee due to the split workgroup with sedimentation.

Tom asked for an action item, to request SOH volunteers for the organizing committee for SEDHYD.

Victor asked if Claudia can take an action item to update the website on the SOH page.

STWIG – no one present

Streamgaging collaborative – Doug Yeskis provided the report.

Doug said to email him if you are not getting emails. Doug will submit a written report to Robert for the minutes.

13. Review actions and plans for next SOH meetings

Robert discussed developing a SOH white paper on hydrologic observation gaps. Sujay mentioned that his group tries to get all existing sources of data and model to provide a continuous dataset. Sujay would like a summary from the group of the status of existing data and what the gaps are. He would like to hear back on current observational needs and gaps.

Robert asked if NASA or the SOH will write the white paper. Sujay said that NASA will write it from the SOH perspective. Robert wanted to know if this is the proper domain for a work group or whether we would feed information to NASA. From NASA's perspective, they want to see data used in more applications. Robert asked if we need a work group to draft the paper. Tom commented that in the past the SOH had used task forces instead of work groups, with a white paper at the end. Then the task force can continue after the white paper or end at that point.

Tom is interested in the work. Claudia wondered if any of the other subcommittees under ACWI are looking into these issues. A task force or work group may be a way of handling that.

Tom suggested NASA can come to SOH with the white paper, then the group can decide if it needs a work group. It relates to ESEWG. Sujay agreed that this may be long term. **NASA to draft the white paper.**

Claudia suggested that what came out of this today is contacts for Sujay, and he can call people as needed.

Dave Goodrich noted that the White House Office of Science and Technology Policy (OSTP) has started reports on earth science assessment. He can send the group a background PowerPoint. The task is to look at earth observations versus societal benefits. Robert and Dave are co-leading the water resources group. John Bolten is another member. Part of the process was to identify information experts on various observations, and developing a weighting scheme to determine the importance of various observations. Subcategories included water availability, water extremes and water use. The different weightings were applied by information experts.

Dave is also involved with the decadal survey, looking at what should be mission priorities in the 2020-2040 timeframe. The SOH may need to form a new subcommittee or task force to look at these reports. They may go a long way to address what is being discussed.

Robert stated the OSTP is a fairly high level document. Perhaps the SOH could add meat to the bones of that document.

Tom recommends that Sujay/NASA go forward with white paper. We can have Tim Stryker report to the SOH. It may be good to get the National Academy of Sciences involved. **Robert will take an action to get a presentation by the OSTP group for the October meeting.**

Vic recommends that NASA be very active as a SOH member, especially by providing a business report to the SOH. Will noted that only about 3-4 agencies generally report.

Tom recommends that we say yes to NASA to begin white paper. There is a concern that when the broader ACWI hears about this, they might wonder if other agencies have the same issue.

Tom made a motion to encourage NASA to complete an information paper in which they identify data presently being collected and any data gaps. Vic seconded the motion. There were no objections and the motion passed.

Mathini can provide comments from the private sector, they are very interested.

The next quarterly meeting will be October 20. Robert asked for any volunteers to host. There were no volunteers at the meeting, so **Robert will find a host for the next meeting.**

Tom made a motion to adjourn, as well an expression of gratitude to NASA. Jack Felbinger seconded. The meeting adjourned at 3:45 pm.

Attachment 1 - Roll call

In person

Robert Mason, USGS*

Sujay Kumar, NASA*

Victor Hom, NOAA/NWS*

Marie Peppler, USGS

Matt Rodell, NASA

Dalia Kirschbaum, NASA

John Bolten, NASA

Fritz Policelli, NASA

Will Thomas, ASFPM*

Jack Felbinger, Office of Surface Mining Reclamation and Enforcement*

Tom Nicholson, NRC*

Claudia Hoeft, NRCS*

Mathini Sreetharan, Dewberry

Sam Lin, FERC*

Laura Chap, STARR II

Ashley Knoll, STARR II

Ed Kim, NASA

Thomas Holmes, NASA

Christa Peters-Lidard, NASA

On phone

Martin Becker, Defenders of Property Rights*

Jerry Coffey

Don Woodward, Global Ecosystems Center*

Bob Blod

Dave Goodrich, USDA*

Doug Yeskis, USGS

Peter Evans, Interstate Council on Water Policy

Brian Beucler, FHWA*

*Denotes SOH member

**Hydrologic Frequency Analysis Work Group (HFAWG) Report for the Subcommittee on
Hydrology Meeting on July 28, 2016**

The public review comment period for Bulletin 17C ended on April 22, 2016, just one day after the April 21, 2016 Subcommittee on Hydrology (SOH) meeting. Since closure of the public comment period, the authors of Bulletin 17C have been reviewing and responding to those review comments. John England, USACE, has been leading/coordinating this effort.

The results of the public review and the status of responding to those comments include:

1. There were 50 public comments submitted. Comments were compiled in a spreadsheet, with additional detail/supporting material submitted on eight (8) comments.
2. Most comments (such as those from ASFPM and USACE) were very positive, supportive, and suggested minor clarifications or revisions to the draft.
3. Most of the comments were minor; authors have addressed them by brief written responses, explanations, and minor edits to the draft Bulletin.
4. Two comments were made regarding extrapolation. Authors are in the process of adding a brief, new section to the Bulletin to address them.
5. Several comments necessitated authors to prepare longer written responses; no revisions were needed to the draft Bulletin based on these comments.
6. Authors have prepared written responses to all 50 comments in spreadsheet format. We have addressed most of the comments with minor revisions to the draft Bulletin. We are working to complete the remaining minor revisions to address Frequency Curve Extrapolation, Record Extension (Appendix 7) and Examples (Appendix 9).

In late May and early June, SOH members voted to approve the USGS Peer Reviewers. There were 22 votes in favor of the slate of peer reviewers and no negative votes. The peer reviewers include:

- Chuck Kroll, Professor, SUNY University,
- Henry Hu, Consultant, WEST Consultants,
- Ben Pope, Consultant, AECOM,
- Gabriele Villarini, Professor, University of Iowa, and
- Rich Vogel, Professor, Tufts University

As soon as we have a revised draft of Bulletin 17C and have final responses to all the public review comments, we can move forward with the USGS Peer Review Process. The plan is to have the USGS Peer Reviewers provide comments within one month of receiving the revised Bulletin 17C.

Will Thomas
Michael Baker International
Chair of the HFAWG

Report of the Extreme Storm Events Work Group to the SOH at the July 28, 2016 Meeting

by Tom Nicholson, Interim Chair and Marian Baker, Vice-Chair

The Proposal Writing Team (PWT) of the Extreme Storm Events Work Group (ESEWG) met at the NOAA/NWS offices, Silver Spring, MD on Monday, May 16, 2016 to continue work on the national proposal “Extreme Rainfall Product Needs.” Dr. Sanja Perica, Director, Hydrometeorological Design Studies Center, Office of Hydrologic Development, National Weather Service/NOAA was the meeting host. Dr. Perica and her staff provided teleconferencing services to those attending remotely.

In attendance were: Marian Baker, PWT Chair and ESEWG Vice-Chair, USACE; Sanja Perica, NOAA/NWS; and Tom Nicholson, ESEWG Interim Chair. Those participating remotely were: Claudia Hoeft, USDA/NRCS; Dongsoo Kim, National Centers for Environmental Information (NCEI) /NOAA; John Onderdonk, FERC; Li-Chuan Chen, NOAA; and Mark Perry, State of Colorado/Dam Safety Branch.

Tom Nicholson, Interim ESEWG Work Group Chair opened the meeting by introducing the attendees and the PWT Chair, Marian Baker, USACE – Kansas City, MO.

Marian Baker reviewed through the proposal’s table of contents of the May 2016 draft of the ***Proposal of Extreme Rainfall Product Needs***, and discussed the four principle product needs:

1. NOAA Atlas 14 Update and Future Updates
2. U.S. Extreme Precipitation Database
3. Guidance for using a Statistical Update to PMP
4. Updating of Hydrometeorological Reports (HMRS) and an Updated Specific Instructions for the Creation of Site-Specific PMP Studies.

Sanja Perica, NWS will update the proposal's cover page art, and Chapter 2.1 on "NOAA Atlas 14 Update and Updates" using new reports recently issued. She will also include a short write-up related to Climate Change involving NOAA Atlas 14.

Marian Baker will further develop Chapter 2.2 on the "U.S. Extreme Precipitation Database." She will discuss with Chandra Pathak, USACE Headquarters, the MetVue tool and various database sources being used to develop the USACE database. She also plans to discuss with Dr. Pathak, a proposal to house the USACE database at the National Centers for Environmental Information (NCEI) and possible follow-up with Dr. Brian Nelson, NCEI.

In the present draft, "Table 1 – Remaining Tasks to Complete Extreme Storm Database" was discussed. It was decided that each Principle Need Chapter will have a similar table but slightly modified (see below) and a unified Table in the Appendix to include \$ estimates (see next page) which will not be released to non-Federal members.

Table for Chapter X Product Needs & Estimated Resources to Accomplish

Task/Product(s)	Timeframe (Short-term 3 yrs or less) (Long-term more than 3 yrs)	Agencies with the need	Staff Resources Needed
Update all HMRs	Long-Term 10 yrs	USCOE, U.S. NRC, FERC, States	
HMR 49	Short-Term 2 yrs		
HMR 51	Short-Term 2 yrs		
HMR 52	Short-Term 2 yrs		

Table for Appendix on Product Needs and Estimated Resources to Accomplish

Task/Product(s)	Timeframe (Short-term 3 yrs or less) (Long-term more than 3 yrs)	Agencies with Need	Staff Resources Needed	Total Estimated Cost in \$
Update all HMRs	Long-Term 10 yrs	USCOE, U.S. NRC, FERC, States		
HMR 49	Short-Term 2 yrs			
HMR 51	Short-Term 2 yrs			
HMR 52	Short-Term 3 yrs			

The topical need on “Guidance for Site-Specific PMP Studies — Updating the Series of NWS Hydrometeorological Reports (HMRs)” will include input from Mark Perry’s synthesis report for the May 2014 Federal and State Workshop on precipitation product needs. Specific recommendations identified

by Bill McCormick in his July 2015 State of Colorado — Dam Safety presentation to ESEWG, will also be included. The consensus was that the chapter will also include a summary on guidance needs developed by John Onderdonk, FERC and his colleagues, Ken Fearon and Sam Lin of FERC. The “need summary” will discuss information from FERC’s guidance to its Review Boards concerning their detailed reviews of PMP estimates at the various dam sites. The overall need is to update the HMR studies, and guidance to review both Federal and individual State-sponsored PMP studies.

Following discussions on whether to include the topical product need, “Guidance for using a Statistical Update to PMP,” it was decided to retain the topical need despite the lack of technical material supporting the need. The need is to identify and address methodologies for conducting probabilistic analyses for estimating extreme rainfall amounts and their frequency. Mark Perry agreed that it should be retained because of the need to move toward a risk analysis approach which requires frequency estimates on extreme rainfall events. Following the PWT meeting, Marian Baker, Chair reached out to Victor Hom, Past Chair of SOH, to discuss ways to fill the missing information. A separate teleconference was held July 21, 2016 with Marian Baker, Victor Hom and Tom Nicholson to determine a path forward to complete this partially developed chapter.

The previous draft had a chapter “2.5 Extreme Precipitation Estimate Tool (EPET)” by Aaron Byrd, USACE and Joseph Kanney, U. S. NRC. This chapter will be dropped since there has been no development. Information from the USACE’s HEC-MetVue Tool will be incorporated into Chapter 2.2 on USACE’s Extreme Precipitation Database. Marian Baker will discuss this proposal changes with Chandra Pathak, USACE. Aspects of HEC uncertainty analyses and HEC-MetVue are being considered for incorporation into the chapter on statistical updates to the PMP.

Victor Hom suggested a replacement chapter for 2.5 on a **Risk-Based Approach** using relevant information on precipitation needs from the “Proceedings of the Workshop on Probabilistic Flood Hazard Assessment’ (NUREG-CP-0302 with link to: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/conference/cp0302/>)

It was agreed that financial resource estimates for the needed products and their specific tasks will be enumerated in a separate appendix since it will be subject to revisions and should not for released to non-Federal members of the ESEWG and SOH.

Dongsoo Kim, NCEI discussed data quality issues, particularly with regard to rainfall data input to watershed modeling. Sanja Perica, NOAA/NWS also discussed how her group conducts detailed data quality reviews and provides their findings to NCEI. It was agree that a special meeting of the entire ESEWG be convened to discuss precipitation data quality. Sanja agreed to host the meeting this summer in cooperation with Dongsoo and his NCEI colleagues.

Dongsoo Kim, NOAA; Li-Chuan Chen, NOAA; and Chandra Pathak, USACE had previously agreed to be peer-reviewers of the draft Proposal prior to issuance to the ESEWG. Marian Baker sent the May 2016 draft of the Proposal to them prior to the May 16, 2016 meeting.

Sanja will provide a “Doodle-Poll” to establish the dates and times for the next meeting of the Proposal Writing Team. The next meeting will focus on the transmittal and briefing of the proposal to the entire ESEWG by August 31, 2016.

Marian has incorporated the chapter contributions she received and will send the revised draft proposal to reflect the agree-upon changes, and provide it to the writing team members by August 24, 2016.

We anticipate the next steps to be:

- Send the updated draft of ESEWG Proposal to PWT on August 31
- Forward final draft of ESEWG Proposal to SOH by September 30
- SOH provides comments on draft ESEWG Proposal at October SOH meeting
- October 2016 SOH Meeting - Motion to Approve the Recommendations
- Cost Estimates to PWT by SOH agencies by the end of FY17Q1
- ESEWG Proposal with agreed-upon cost estimates to SOH by December 2016
- Discussion on Cost Estimates and Motion to Assemble Final Report at January 2017 SOH Meeting.

Attachment 4 – HMWG Report (Claudia Hoeft)

Hydrologic Modeling Work Group Report:

The SEDHYD organizing committee recently finalized the language for the request for proposals to be sent out very soon to get estimates for hotel/conference facilities. The RFP will be sent to various cities/locations across the United States - including, but not restricted to locations in Nevada.

Communications continues to be an issue among the SEDHYD organizing committee since committee leadership is with the Subcommittee on Sedimentation - and they seem to forget to notify their SOH counterparts. This is improving as SEDHYD specific efforts intensify (and Claudia keeps complaining about it).

There is still a need for additional SOH volunteers to serve on the organizing committee. Contact Claudia Hoeft if you are interested.

Attachment 5 – FERC Report (Sam Lin)

FERC Report for July 2016 SOH Meeting

1. In July, FERC lead a session on Affordable and Scalable Solutions for Risk-informed Decision Making in the Civil Works & Dam Safety Session of HydroVision International Conference in Minneapolis, MN. The session of panelists presented different approaches to risk-informed decision making around the world related to market acceptance, penetration and understanding. FERC also moderated and participated in a panel on new technologies to discuss spillway models, flood/inundation models, stability/deformation models, geo-referenced data collection, and web-based GIS mapping & publishing.
2. In July, FERC performed its annual dam safety inspection of the East Fork Project located in Jackson County, North Carolina. The Project's high hazard potential Cedar Cliff Dam does not meet FERC H&H criteria because it can only accommodate approximately 0.43PMF for this dam (IDF = PMF). The licensee is designing remediation for the dam that includes rock excavation and a labyrinth weir fuse gate.
3. In June, FERC met with the licensee NorthWestern Energy in Bozeman, Montana to discuss including the final Board of Consultant's report for the SSPMP and PMF Studies and ongoing spillway reconstruction for the Hebgen Dam, repair of the flowline following rockfall damage at Madison Dam, future dam safety construction plans, independent consultant inspections and recommended outstanding actions, FERC dam safety inspection schedule, and other relevant issues.

Attachment 6 – NWS Report (Vic Hom)

SOH Member Business Reports (July 2016)

NOAA

Office of Water Prediction (OWP)

The organization, the National Water Center (NWC), was created on April 1, 2015 as part of the reorganization of NWS Headquarters and new portfolio-based budget structure. Since that time, the organization has shared the title of “National Water Center” with NOAA’s new facility located in Tuscaloosa, Alabama. To provide clarity and ensure a clear distinction between the organization and the building, the organization underwent a name change. Effective Sunday June 26, the new name of this NOAA NWS organization became known as the Office of Water Prediction (OWP), to highlight the important role of NWS in the Federal water enterprise for water prediction.

National Water Model (NWM)

The National Water Model (NWM) is a hydrologic model that simulates observed and forecast streamflow over the entire continental United States (CONUS). The NWM is expected to complement current modeling which is done for approximately 4000 locations across the CONUS by providing information at a very fine spatial and temporal scale at those locations, as well as for locations that don’t have a traditional river forecast. The model runs an hourly uncoupled analysis (simulation of current conditions). Short-range forecasts are executed hourly while medium-range forecasts out to 10 days are produced once per day. A daily ensemble long range forecast to 30-days is also produced. All NWM configurations provide streamflow for 2.7 million river reaches and other hydrologic information on 1km and 250m grids. NOAA is working to implement the NWM (Version 1.0) in the summer of 2016 as a significant first step to transform NOAA’s water prediction services. For more info, see [link](#).

NOAA Water Conversations

NOAA sponsored three meetings which took place in Tuscaloosa, AL (May 18-19), Sacramento, CA (May 25-26) and Washington, D.C. (July 12-14). The meetings, entitled "U.S. Water Information in the 21st Century: A Conversation on Integrated Information and Services", featured Dr. Kathryn Sullivan, Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator, NOAA staff, NWS leadership, key partners, and stakeholders. The intent of these meetings is to initiate a broader national conversation among key stakeholders about what steps can be taken to develop and deliver more robust and integrated water-related data, information, and prediction services that will help communities and businesses manage risk and plan for the future. For more info, see [link](#).

ASFPM 2016 (6/20-6/23)

On June 20, representatives from USACE, USGS, and NOAA provided a 4 hour workshop on IWRSS FIM at ASFPM 2016. USACE also gave an additional presentation at breakout session showing how USACE will be sharing EAP maps during Dam Emergencies to the NWS as an Event Map using the IWRSS FIM Design and Business Rules described in the Design Report. NOAA, USGS, and FEMA supported this event by presenting, moderating, and staffing exhibit booths. For more info, see [link](#).

Summer Institute 2016

The Summer Institute 2016 took place at the University of Alabama and the National Water Center from June 6 - July 20, 2016. Student research fellows will collaborate intensively for seven weeks to work on projects designed to contribute to the NWC goals of enhancing water-related products and decision-support services across the country. This year, the students focused on Flood Modeling, Inundation Mapping, Forecast Uncertainty, and Emergency Response. For more info, see [link](#).

Attachment 7 – FHWA Report (Brian Beucler)

Big news for us is that we will be releasing our 2nd edition of HEC-17 “Highways in the River Environment- Floodplains, Extreme Events, Risk and Resilience” very soon after we roll it out officially during our National Hydraulic Engineers Conference in Portland Oregon Aug 9-12.